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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,367	01/25/2002	Anthony E.G. Cass	620-183	7631

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NIXON & VANDERHYE P.C.  
8th Floor  
1100 North Glebe Road  
Arlington, VA 22201-4714

EXAMINER
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FORMAN, BETTY J

ART UNIT	PAPER NUMBER
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1634

DATE MAILED: 09/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/055,367	CASS, ANTHONY E.G.	
	<b>Examiner</b>	<b>Art Unit</b>	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 32-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 06/03.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group I, Claims 1-31 in papers filed 25 June 2003 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Objections***

2. Applicant is advised that should claim 9 be found allowable, claim 21 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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4. Claims 9, 11-12, 21, 24, 27 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 9 is indefinite for the recitation "the ligand binding site" because the recitation lacks proper antecedent basis in Claim 1. It is suggested that Claim 9 be amended to provide proper antecedent basis.

b. Claims 11 and 12 are each indefinite for the recitation "are modified to contain" because it unclear whether the recitation is method step of modification.

c. Claim 21 is indefinite for the recitation "the ligand binding site" because the recitation lacks proper antecedent basis in Claim 1. It is suggested that Claim 21 be amended to provide proper antecedent basis.

d. Claim 24 is indefinite for the recitation "label is attached at different amino acid positions" because "different" is a relational term, but it is unclear what different amino acid is being described. For example, it is unclear whether the recitation is describing an amino acid different from the cysteine or whether the recitation is describing multiple and/or unique amino acids within the binding site.

e. Claim 27 is indefinite in the recitation of abbreviations i.e. IANBD, IAANS, MIANS, IAEDANS because the meaning of abbreviations may change over time.

f. Claim 29 is indefinite in being dependent from Claim 28 because while Claim 29 limits the proteins to mammalian or insect, it broadens the scope of the mammalian or insect proteins to encompass any mammalian or insect binding proteins not encompassed by the limitations of Claim 27.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 20 and 25-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Gold et al (U.S. Patent No. 6,242,246, filed 15 December 1997).

Regarding Claim 1, Gold et al disclose a detector array comprising one or more groups of broad specificity biological sensing elements and variants thereof (Column 2, lines 27-37) discretely immobilized onto a solid support wherein the sensing elements have attached thereto a detectable label (Column 13, lines 37-59 and fig. 5).

Regarding Claim 2, Gold et al disclose the detector wherein there is at least one group (Column 3, lines 14-24).

Regarding Claim 3, Gold et al disclose the detector wherein there are from 2 to 50 groups (Column 3, lines 14-24).

Regarding Claim 20, Gold et al disclose the array wherein the detectable label is susceptible to change upon ligand binding (Column 13, lines 37-59).

Regarding Claims 25-27, Gold et al disclose the label is a fluorescent probe selected from the claimed group (Column 15, lines 44-65).

7. Claims 1-5, 9-10, 13-14, 20-21, 25, 28-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Reed et al (U.S. Patent No. 6,492,143, filed 17 December 1998).

Regarding Claim 1, Reed et al disclose a detector array comprising one or more groups of broad specificity biological sensing elements and variants thereof discretely immobilized onto a solid support wherein the sensing elements have attached thereto a detectable label i.e. the cells contain both the expression vector and fluorescent dye whereby the sensing elements are attached to the dye via being contained within the same cell (Column 32, line 50-Column 34, line 3).

Regarding Claim 2, Reed et al disclose the detector wherein there is at least one group (Column 34, lines 58-67).

Regarding Claim 3, Reed et al disclose the detector wherein there are from 2 to 50 groups (Column 34, lines 58-67).

Regarding Claim 4, Reed et al disclose the detector wherein the group consists of a biological sensing element and from 1 to 100 variants (Column 34, lines 58-67).

Regarding Claim 5, Reed et al disclose the detector wherein the group consists of a biological sensing element and from 5 to 25 variants (Column 34, lines 58-67).

Regarding Claim 9, Reed et al disclose the detector wherein the element is a polypeptide comprising a ligand binding site (Column 7, lines 42-58).

Regarding Claim 10, Reed et al disclose the detector wherein the ligand binding site contains one or more cysteine residues (Example 1, e.g. Column 23, lines 5-11 and 39-44, Column 24, lines 5-9 and 38-42).

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Regarding Claim 13, Reed et al disclose the detector wherein a variant is derived from a sensing element (i.e. odorant-binding protein) and differ is binding specificity (Column 34, line 58-Column 35, line 45).

Regarding Claim 14, Reed et al disclose the detector wherein the element is a polypeptide comprising a ligand binding site (Column 7, lines 42-58).

Regarding Claim 20, Reed et al disclose the detector wherein the label is susceptible to change upon ligand binding i.e.  $\text{Ca}^{+2}$  dependent signal is detected (Column 33, line 28-Column 34, line 3).

Regarding Claim 21, Reed et al disclose the detector wherein the element is a polypeptide comprising a ligand binding site (Column 7, lines 42-58).

Regarding Claim 25, Reed et al disclose the detector wherein the label is a fluorophore (Column 33, line 32-34).

Regarding Claim 28, Reed et al disclose the detector wherein the sensing element is an odorant binding protein (Abstract).

Regarding Claim 29, Reed et al disclose the detector wherein the sensing element is a mammalian binding protein (Column 8, lines 52-55 and Example 1, Column 22, lines 15-17).

Regarding Claim 30, Reed et al disclose the detector wherein the sensing element is a human odorant binding protein (Column 8, lines 52-55).

Regarding Claim 31, Reed et al disclose a detector array comprising a plurality of discrete biological sensing elements immobilized onto a solid support wherein each sensing element has a ligand binding site capable of binding a broad range of structurally diverse ligands, the sensing element are provided in groups, each comprising at least one variant differing ligand binding from the element from which it was derived (Column 34, line 56-Column 35, line 45) and each sensing element and variant having a detectable label attached wherein the physical characteristics of the label being susceptible to change upon ligand binding i.e.  $\text{Ca}^{+2}$  dependent signal is detected (Column 33, line 28-Column 34, line 3).

8. Claims 6-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Reed et al (U.S. Patent No. 6,492,143, filed 17 December 1998) as defined by Dal Monte et al (Chemical Senses, 1993, 18(6): 713-721).

Regarding Claims 6-8, Reed et al disclose a detector array comprising one or more groups of broad specificity biological sensing elements and variants thereof discretely immobilized onto a solid support wherein the sensing elements have attached thereto a detectable label i.e. the cells contain both the expression vector and fluorescent dye whereby the sensing elements are attached to the dye via being contained within the same cell (Column 32, line 50-Column 34, line 3) wherein the sensing elements are human odorant-binding proteins (Column 8, lines 52-67) which Dal Monte et al define as being less than 50kDa (Abstract).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject



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matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 11-12, 15-19 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Reed et al (U.S. Patent No. 6,492,143, filed 17 December 1998) in view of Hoffman et al (U.S. Patent No. 5,998,588, filed 30 August 1996).

Regarding Claims 11-12, 15-19 and 22-24, Reed et al disclose a detector array comprising one or more groups of broad specificity biological sensing elements and variants thereof discretely immobilized onto a solid support wherein the sensing elements have attached thereto a detectable label i.e. the cells contain both the expression vector and fluorescent dye whereby the sensing elements are attached to the dye via being contained within the same cell (Column 32, line 50-Column 34, line 3) wherein the element is a polypeptide comprising a ligand binding site (Column 7, lines 42-58). Reed et al do not teach the ligand binding site is modified to contain cysteine residues or the variants contain from 1 to 5 or 2 to 4 points of difference from the element from which they were derived and which affects binding specificity. However, Hoffman et al teach a similar detector array wherein biological sensing elements are immobilized onto a solid support and have a label attached thereto wherein variants of the sensing elements being modified to contain cysteine residues and having between 2 to 4 amino acids difference binding elements wherein the differences affect binding specificity (Column 16, lines 10-58) wherein the label is attached to a cysteine residue within the binding site or at different amino acid positions within the binding site (Column 11, line 61-Column 12, line 32; Column 16, lines 48-58 and Column 16, line 59-Column 17, line 41) wherein the binding site modifications provide the means for directing and controlling binding interactions (Column 2, lines 50-57). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the binding analysis of Reed et al by modifying the

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binding site to contain cysteine residues and labels to thereby direct, control and detect binding interactions as taught by Hoffman et al (Column 2, lines 50-57).

11. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Reed et al (U.S. Patent No. 6,492,143, filed 17 December 1998) Gold et al (U.S. Patent No. 6,242,246, filed 15 December 1997).

Regarding Claims 26 and 27, Reed et al disclose a detector array comprising one or more groups of broad specificity biological sensing elements and variants thereof discretely immobilized onto a solid support wherein the sensing elements have attached thereto a detectable label i.e. the cells contain both the expression vector and fluorescent dye whereby the sensing elements are attached to the dye via being contained within the same cell (Column 32, line 50-Column 34, line 3) the label is a fluorophore (Column 33, line 32-34) but they do not teach the label is a fluorescent probe selected from the claimed group. However, Gold et al teach a similar method comprising one or more groups of broad specificity biological sensing elements and variants thereof (Column 2, lines 27-37) discretely immobilized onto a solid support wherein the sensing elements have attached thereto a detectable label (Column 13, lines 37-59 and fig. 5) wherein the label is a fluorescent probe selected from the claimed group (Column 15, line 44-Column 16, line 45) and wherein the fluorescent probe provides for binding analysis in a position-specific and dynamic manner (Column 15, lines 60-65). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the fluorescent probes of Gold et al to the labeled sensing elements of Reed et al

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for the expected benefit of obtaining binding analysis in a position-specific and dynamic manner as taught by Gold et al (Column 15, lines 60-65).

#### **Prior Art**

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Lerner: U.S. Patent No. 6,475,733, filed 14 October 1999.

#### **Conclusion**

13. No claim is allowed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (703) 308-1119. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 308-8724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.



BJ Forman, Ph.D.  
Primary Examiner  
Art Unit: 1634  
September 2, 2003